WE CLAIM:

A piezo actuator drive circuit, comprising: 1.

a drive amplifier having an input, and an output adapted to drive a piezo actuator in a voltage mode; and

a sensing circuit doupled to the drive amplifier sensing the piezo actuator.

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2. The drive circuit as specified in Claim 1 wherein the sensing circuit is selectively coupled to the piezo actuator in a voltage mode.

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The drive circuit as specified in Claim 1 wherein the sensing circuit 3. selectively coupled to the piezo actuator in a charge mode.

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The drive circult as specified in Claim 1 wherein the drive amplifier has a high impedance output in the sensing mode.

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The drive circuit as specified in Claim 4 wherein the sensing circuit 5. provides a signal indicative of the piezo actuator position.

6. The drive circuit as specified in Claim 1 wherein the sensing circuit comprises a resistor divider providing a voltage signal.

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7. The drive circuit as specified in Claim 6 wherein the voltage signal varies proportionally to the piezo actuator load.

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- 8. The drive circuit as specified in Claim 1 wherein the drive amplifier has a feedback, wherein the sensing circuit is a portion of the feedback.
- 9. The drive circuit as specified in Claim 5 wherein the signal is indicative of the piezo actuator load variation.
 - 10. The drive circuit as specified in Claim 1 further comprising a current mirror selectively coupled to the output of the drive amplifier.
 - 11. The drive circuit as specified in Claim 10 wherein the current mirror is selectively uncoupled from the drive amplifier in the sensing mode.
 - The drive circuit as specified in Claim 11 wherein the current mirror is a class AB amplifier.
 - 13. The drive circuit as specified in Claim 1 wherein the drive amplifier has a charge mode feedback configured to allow multiple piezo actuators to be driven in the charge mode.
- 14. The drive circuit as specified in Claim 13 wherein the charge mode feedback includes a DC restore amplifier forming a portion of the sensing circuitry.

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- 5 15. The drive circuit as specified in Claim 14 wherein the DC restore amplifier is reconfigured in the sensing mode.
 - 16. The drive circuit as specified in Claim 15 wherein the reconfigured DC restore amplifier is connected in a closed feedback loop in the charge mode, and in an open feedback loop in the sensing mode.
 - 17. The drive circuit as specified in Claim 1 wherein the drive amplifier has a first output, and a second output having a current mirror based on the first output.
 - 18. The drive circuit as specified in Claim 17 wherein a capacitor is coupled to the first output and the piezo actuators are adapted to be driven by the second output.
 - 19. The drive circuit as specified in Claim 18 wherein a first time constant formed by the capacitor and the voltage mode feedback, and a second time constant formed by the piezo actuators and the voltage mode feedback, are substantially equal.
 - 20. The drive circuit as specified in Claim 13 further comprising a DC control circuit controlling the DC value at the piezo actuator.
 - 21. The drive circuit as specified in Claim 1 wherein the DC control circuit is integrated into the low frequency compensation loop.

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- 22. The drive directi as specified in Claim 1 further comprising a digital-to-analog (DAC) coupled to one drive amplifier input and a voltage reference being coupled to another drive amplifier input.
- 10 23. The drive circuit as specified in Claim 1 further comprising an ADC coupled to the sensing circuit.